COURSE DATA

DATA SUBJECT

Code: 46489
Name: Molecular medicine technology
Cycle: Master's Degree
ECTS Credits: 4.5
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2254 - Master's Degree in Molecular Approaches in Health Sciences	Facultat de Medicina i Odontologia	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2254 - Master's Degree in Molecular Approaches in Health Sciences	Molecular technologies for research in health sciences	COMPULSORY

COORDINATION

O'CONNOR BLASCO JOSE ENRIQUE

LOPEZ RODAS GERARDO

SALGADO BENITO JESUS

SUMMARY

The subject will introduce the student to the concept of Targets in Molecular Medicine and their identification, structural characterization and validation for their application in the development of innovative Therapies. In order to fulfill this teaching objective, the student will be introduced to the new molecular and genetic techniques used in the investigation of the mechanisms and causes of the disease. The course agenda will include lessons on advanced technologies in current Biomedicine. This course includes the collaborative activity of the CIBER-ISCIII. Most of the lessons will be taught by external professors, renowned researchers from the Institute of Biomedicine of Valencia (IBV-CSIC), coordinated by its director (Jordi Pérez-Tur). The IBV-CSIC professors participating in this edition of the subject are PhDs: Vicente Rubio, Jerónimo Bravo, Marçal Vilar, José Luis Llácer, Clara Marco, Susana Rodríguez-Navarro, Helena Mira, Nuria Flames, Carmen Cucarella, Marta Married, Paloma Pérez, Alberto Marina, Pilar González-Cabo and Natalia Tapia.
The subject also has the participation of professors from the Department of Biochemistry and Molecular Biology of the University of Valencia (UVEG), who will teach specific topics related to radiometric and radiodiagnostic methods (Prof. Gerardo López-Rodas) and Proteomics (Prof. Manuel Sánchez del Pino), as well as carrying out a practical part aimed at learning and applying In Silico methods for modeling proteins

known as targets in Cell Signaling and Oncology Therapy (Prof. Jesús Salgado).

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

No enrollment restrictions have been specified with other subjects in the curriculum.

COMPETENCES / LEARNING OUTCOMES

-

Aprender a identificar, manejar y presentar adecuadamente en informes y exposiciones públicas, conocimientos existentes sobre Tecnologías de la Medicina Molecular, usando como vehículo la lengua inglesa.

Conocer, comprender y aplicar en la práctica Tecnologías de la Medicina Molecular en situaciones relacionadas con la investigación básica y clínica.

Conocer en profundidad y comprender la organización a nivel molecular de células, sistemas y procesos de relevancia en las Ciencias de la Salud.

Conocer en profundidad y comprender las bases moleculares de la enfermedad.

Conocer en profundidad y comprender las metodologías de investigación básica aplicables a las Ciencias de la Salud.

Conocer y comprender los conceptos básicos y las aplicaciones en investigación básica y clínica de las Tecnologías de la Medicina Molecular.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

Tener capacidad de analizar y sintetizar un problema.

Tener capacidad de comunicación oral y escrita en una segunda lengua científica.

Tener capacidad de desarrollar un trabajo interdisciplinar.

Tener capacidad de localizar información.

Tener capacidad de trabajar en equipo

DESCRIPTION OF CONTENTS

1. Introduction to the Matter

2. Targets in Molecular Medicine

3. The Value of Genetics for Target Discovery

4. Structural Characterization of Targets

5. Target Validation and Models of Disease

6. Development of Advanced Therapies

7. Radioactive Isotopes and Electromagnetic Radiation (EMR) in Biomedicine

8. Proteomics in Molecular Medicine

9. Radiactive drugs of Clinical Use for Diagnostics

10. Bioinformatic Practical: In Silico Modelling in Molecular Medicine

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	18,00
Seminar	15,00
Group work	8,00
Computer classroom practice	4,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**0,00**

TEACHING METHODOLOGY

EVALUATION

The evaluation of student learning will be carried out by evaluating the following sections:
1) Theoretical exam, multiple choice to be held in the classroom. This test will be worth up to 50% of the final grade and will take place at the end of the second semester. It will include questions from the theoretical and practical lessons given by professors from the Institute of Biomedicine of Valencia (IBV) and the Department of Biochemistry and Molecular Biology.
2) Writing of a work by the student on topics proposed by the IBV professors and oral presentation of the same. This part will be worth up to 40% of the final grade. Before the beginning of the subject, the teaching staff of the same will propose the offer of topics. Each student will choose an individual topic, with no overlap with any other student. For its evaluation, individual presentations will be made before all the classmates of the subject, valuing the content and form of the presentation, as well as the ability to induce questions from the audience. The set of all presentations will occupy a maximum time of 15 hours.
3) Student interest in the subject, expressed as their participation in organized discussions, the answers to

the questions that the teacher asked during the face-to-face sessions, attendance at personal tutorials and/or any other type of activity carried out by the student in relation to the subject. Up to 10% of these concepts can be obtained in the final grade of the subject.

REFERENCES

- Trent, RJ. Molecular Medicine, Fourth Edition: Genomics to Personalized Healthcare. Academic Press (2012) Runge, MS, Patterson, C. Principles of Molecular Medicine. Humana Press(2009) Runge, MS, Patterson, C, McKusick,VA. Principles of Molecular Medicine, Humana Press (2006) Boultwood J, Fidler,C eds. Methods in Molecular Medicine: Molecular Analysis of Cancer. Totowa, NJ: Humana Press (2002) Killeen AA, ed. Methods in Molecular Medicine. Molecular Pathologyv Protocols.: The Humana Press (2000)

- Los distintos profesores de la asignatura proporcionarán referencias bibliográficas específicas al inicio de la misma.